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Labor and the War, 1939 and 1914

THE EFFECTS of a major war are no longer confined to the belligerents. The United States is likely to be particularly affected by the present war in Europe because it is a large producer of foodstuffs and a manufacturer of products that are necessary or useful in the prosecution of a war. If existing legislation prohibiting the sale of such products to belligerents is repealed or amended in a way to give belligerents access to United States markets, accelerated demand, in some lines at least, seems certain to affect economic conditions in this country.

Among the possible effects of the European war on American business, there is one which is at once important but very difficult to predict—the possible effect on labor conditions. However, the facts and trends of today that affect labor conditions can be compared with those obtaining in 1914–1918 and some idea of the likelihood of a repetition of conditions that developed in the earlier period can be formed. It is true, of course, that each new war, like each new business depression, possesses characteristics peculiar to itself that invalidate direct, over-all comparison with earlier wars and depressions. But it is also true that certain basic influences are always operative in such crises. A review of pertinent facts and trends that had significant effects in 1914–1918 should be at least suggestive of developments that in greater or less degree are likely to be repeated during the present war period.

The first effect of the declarations of war in 1914 was to paralyze normal life and business throughout the world. Except to those connected with the various governments, such a catastrophe had seemed unthinkable. In the course of time, however, people everywhere became adjusted to the strange situation and resumed their normal activities on the new basis. In this respect the present situation is different. Events in Europe for several years have been building toward a seemingly inevitable clash. It has appeared to be more a question of when than whether a new conflict would begin. Its actual commencement, therefore, has been attended by no such disorganization of business as occurred in 1914.

The outbreak of war in 1914 found the United States in a business depression that had lasted more than a year, with consequent unemployment and low wages. Recovery of business was powerfully aided by the stimulant of large orders from belligerent countries covering a considerable range of products, as well as direct munitions. Statistical data for the period are scanty, but those that exist show wage levels that seem very low on the basis of present standards. The first comprehensive investigation of wages made by THE CONFERENCE BOARD, soon after its organization in 1916, included wage data for July, 1914. In Table 1 are presented figures for hourly and weekly earnings and average hours of work per week for the 21 industries for which data for both 1914 and 1939 are available.

These figures give a striking picture of how greatly wage levels have increased and working hours have declined since the last great war opened. In many industries average hourly earnings have more than trebled. The advance in weekly earnings is not so great because of the sharply reduced length of the work week. At the beginning of the present war, therefore, wage scales are already at a high level.

A natural effect of increased industrial activity in 1914, due in considerable measure to purchases of bellig-

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TABLE 1: AVERAGE HOURLY AND WEEKLY EARNINGS AND AVERAGE HOURS OF WORK IN 21 INDUSTRIES

July, 1914 and June, 1939

SOURCE: THE CONFERENCE BOARD

	Average Hourly Earnings		Average Weekly Earnings		Average Hours of Work	
	July, 1914	June, 1939	July, 1914	June, 1939	July, 1914	June, 1939
All industries	$.243	$.721	$12.36	$26.79	51.0	37.2
Agricultural Implements	.262	.802	13.43	31.11	55.4	38.8
Automobiles	.291	.960	15.35	33.75	54.3	35.2
Boots and Shoes	.218	.509	11.60	17.72	54.5	34.8
Chemicals	.226	.757	12.77	29.43	56.6	38.9
Cotton—North	.171	.489	8.90	17.99	55.8	36.8
Electrical Manufacturing	.270	.795	13.44	30.09	54.3	37.8
Foundry and Machine Shop	.275	.740	13.51	28.35	55.0	38.3
Furniture	.228	.668	11.23	25.30	55.1	37.9
Hosiery and Knit Goods	.179	.538	8.59	19.21	56.1	35.7
Iron and Steel	.260	.847	13.97	28.37	53.9	33.5
Leather Tanning	.214	.635	11.24	24.43	57.6	38.5
Lumber and Mill Work	.240	.675	12.77	27.18	57.0	40.2
Meat Packing	.216	.707	12.07	28.61	59.3	40.5
Paint and Varnish	.272	.714	13.96	29.98	53.1	42.0
Paper and Pulp	.223	.640	12.14	25.25	56.5	39.5
Paper Products	.192	.609	9.68	24.28	54.8	39.9
Printing—Book	.304	.836	13.82	32.05	49.7	38.4
Printing—Newspaper	.415	.967	18.05	35.26	52.1	36.4
Rubber	.256	.849	12.75	29.78	52.8	35.1
Silk	.193	.536	9.88	17.74	54.0	33.1
Wool	.185	.586	9.77	20.67	53.6	35.3

erent nations, was a rise in prices which became accelerated under the sustained European demand for the products of American plants. Rising prices became reflected in the cost of living, and wage earners found their earnings inadequate. This situation precipitated a series of adjustments, but for several reasons these adjustments were never effective in solving the real difficulty because of lack of uniformity in the situations in which different industries found themselves, and because of the well known economic fact that a rise in wages tends to lag behind a rise in prices.

One difficulty was that the situations were quite different in the various industries. In some, war orders at very satisfactory prices made the granting of wage increases no great problem. In others, which had felt little or no direct war stimulation, wage increases presented a difficult problem, and yet wage earners in these industries had to pay the same higher prices for commodities as others. Moreover, as the rise in prices became more rapid, increases in some wages never seemed quite to catch up with the mounting cost of living, and even when a balance was achieved it did not last, as a further advance in prices would again leave wages behind.

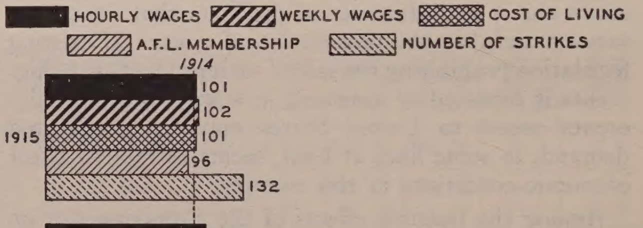
Obviously, such a situation was certain to cause labor discontent, and this was quickly reflected in the number of strikes. Figures of the United States Department of Labor show a total of 1,204 strikes in 1914. This figure rose to 1,593 in 1915, to 3,789 in 1916, and to 4,450 in 1917. Such a rapid increase in industrial disputes is clear evidence of the unsatisfactory labor conditions of the period.

Coincidentally, membership in the American Federation of Labor began to rise, first slowly and later more rapidly, in spite of considerable opposition from employers. In 1916 total membership in affiliated unions had increased 3% over 1914, but by 1917 this increase had risen to 17% and in 1918 to 35%. Quite a different form of union organization, which caused considerably more concern, was the gain in strength of the International Workers of the World, particularly in the Pacific Northwest. This organization, because of its anarchistic doctrines, became a dangerous threat to the successful prosecution of the war by the United States.

Accurate statistical data covering labor conditions from 1914 to 1918 are regrettably scanty. However, Chart 1 has been prepared from data that are available to show changes that took place during war years in important indexes of labor conditions. Average conditions in each year are shown in terms of their deviation from the average for 1914. At the bottom, data for 1938

CHART 1: INCREASE IN WAGES AND COST OF LIVING 1914–1918 AND 1938

Index Numbers, 1913 = 100



* INCLUDES ESTIMATED C.I.O. MEMBERSHIP

are given to show how different is the situation at the beginning of this war from what it was in 1914. It is interesting that the only factor which in 1938 is substantially similar to what it was in 1918 is the cost of living. The fact that wage levels in 1938 are so much higher than in 1914, while the cost of living is at practically the same level, indicates in how superior a position labor earnings are today compared with what they were in the previous war period.

The rapidity of acceleration of increases in wages[1] and the cost of living is shown on Chart 2, based on figures compiled by the Federal Reserve Bank of New York. The chart shows the kind of hide-and-seek game played during the war period by these factors so essential to the wage earner's well being.

One series of wage figures computed monthly for the entire war period is that of the New York State Department of Labor covering average weekly earnings for both factory and office workers combined. These figures provide a valuable indication of the income of rank and file employees, including both manual and clerical workers, and, since New York State industry is very comprehensive in character, almost a smaller scale replica of United States industry, these figures should be fairly representative for the country as a whole. As indicated in Table 2, these weekly earnings increased first at a relatively slow rate, but this rate steadily accelerated as the war progressed into the later stages.

TABLE 2: AVERAGE WEEKLY EARNINGS—NEW YORK STATE: 1914–1918 AND 1938, OFFICE AND FACTORY

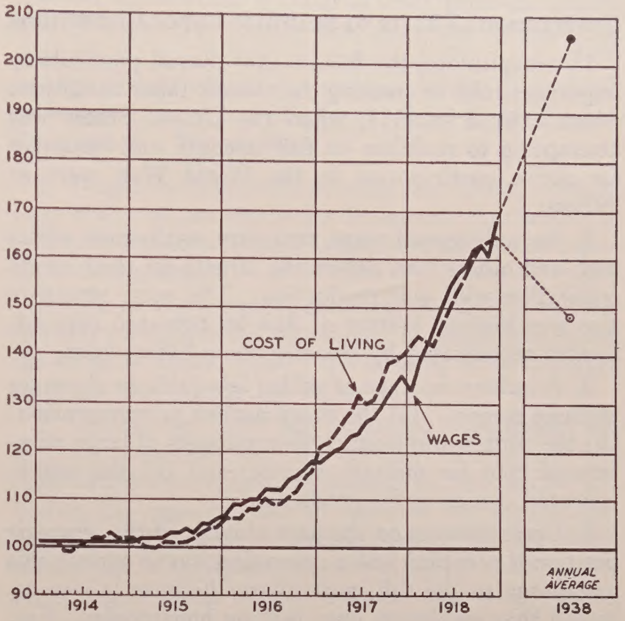
Source: New York State Department of Labor

	1914	1915	1916	1917	1918	1938
January	.....	$12.44	$13.53	$15.28	$16.81	$25.96
February	.....	12.41	13.77	15.31	17.66	26.35
March	.....	12.65	13.96	15.79	18.71	26.46
April	.....	12.54	14.15	15.50	19.25	25.86
May	.....	12.74	14.24	16.08	19.91	25.56
June	$12.70	12.81	14.41	16.20	20.44	25.71
July	12.54	12.66	14.11	16.17	20.78	25.99
August	12.53	12.89	14.44	16.44	21.23	26.50
September	12.48	12.86	14.87	16.97	22.31	27.16
October	12.26	13.30	14.95	17.33	22.34	26.88
November	12.32	13.45	15.16	17.69	21.60	26.27
December	12.56	13.49	15.51	17.71	23.18	26.90
Average for year	$12.48a	$12.85	$14.43	$16.37	$20.35	$26.29

a7 months.

CHART 2: CHANGES IN LABOR CONDITIONS, 1915–1918 AND 1938

Index Numbers, 1914=100



The labor situation became more acute after the entry of the United States into the war in April, 1917. It now became necessary to give the United States priority and still not shut off the supply of its allies. Every company that could in any way adapt its equipment and facilities to the manufacture of necessary articles did so. The combined effect of the tremendously expanded demand for certain types of war materials and the removal from industry of growing numbers of men for war service was to create an increasingly acute shortage of skilled workers.

Many with no previous experience in mechanical operations were taught certain simple operations that could be quickly mastered. Women in steadily increasing numbers were absorbed into industry, and many replaced men in occupations hitherto considered as requiring male operators. But the number of highly skilled craftsmen could not be so easily enlarged, and here there developed cut-throat competition between employers for the available and limited supply. One company would entice labor away from another by the promise of higher wages, only to lose this labor to a third company that employed the same tactics. Skilled labor, conscious of its favorable position, drove wages steadily up. This was made the more easy by the "cost plus 10 per cent" basis on which government contracts were awarded and which made employers much more interested in speedy delivery than in economy of operation.

Two years and a half of war before the active participation in it of the United States had developed a war economy in this country and had allowed time for the development to an acute stage of conditions created by dislocations caused by the war. Consequently, disturbing factors in the labor situation rapidly reached crises and precipitated a series of government-sponsored efforts to straighten out the tangled industrial relations situation.

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[1] The series for wages is a composite index based on earnings, when available, and otherwise on wage rates covering labor in factories, building construction, railroads, agriculture, road building, bituminous coal, power and light, telephone and telegraph, and such types of employees as teachers, clerical workers, and those in hotels and in retail trade.

Government Efforts to Stabilize Labor Conditions

To recapitulate, the factors that played particularly important roles in creating the chaotic labor conditions which existed in 1917, when the United States was attempting to mobilize its full strength and resources for active participation in the World War, were as follows:

1. An unbalanced wage structure, with some scales high and others low, depending largely on their direct connection with war production. The wage structure also was kept in a state of flux by repeated rate advances necessitated by steadily rising living costs.

2. A serious shortage of skilled labor due in the main to three reasons: (a) the sharp decline in immigration; (b) the withdrawal from civilian pursuits of large numbers of men for military service; and (c) the unprecedented demands for production.

3. Consciousness on the part of labor of the strategic position it occupied and a determination to exploit this advantage to the full, particularly because it was assumed that employers were making huge profits. Employers were at the same time faced with a serious decline in efficiency because employees felt secure against discharge in the knowledge of a labor shortage, and plant discipline was weakened.

4. Intensified effort on the part of organized labor to increase its membership and establish itself more strongly. Most employers resisted these efforts. This resistance, combined with conditions mentioned above, resulted in a large increase in labor disputes.

Government activity in employer–employee relations during 1917 and 1918 took many forms. Only the briefest reference to the various agencies for facilitating uninterrupted production is possible here.

The general plan of procedure that guided government participation in dealing with labor problems was to organize special machinery to handle particular difficulties as they arose. Before this country's entrance into the war a Council of National Defense had been established, and this body had appointed an advisory commission on labor matters, of which Mr. Samuel Gompers, President of the American Federation of Labor was an active member. He secured adoption by a general conference of labor leaders, employers, and representatives of the public of an agreement that "neither employers nor employees shall endeavor to take advantage of the country's necessities to change existing standards." This excellent principle was more easily stated than enforced.

Intensification of labor controversies, aggravated in particular by activities of the I.W.W., convinced President Wilson that a special effort should be made to harmonize differences. He accordingly appointed, in September, 1917, a special President's Mediation Commission, with the Secretary of Labor as Chairman and Mr. Felix Frankfurter as Secretary, the purpose of the Commission being not only to settle specific labor disputes, but also to study conditions and to recommend more permanent solutions for problems. All fields of business activity and the entire country were within its scope. It ceased to function in January, 1918, but its conclusions, contained in its final report, are worthy of reexamination at this time. They were:

> The causes of unrest suggest their own means of correction:
>
> 1. The elimination to the utmost practical extent of all profiteering during the period of the war is a prerequisite to the best morale in industry.
>
> 2. Modern large-scale industry has effectually destroyed the personal relation between employer and employee—the knowledge and cooperation that come from personal contact. It is therefore no longer possible to conduct industry by dealing with employees as individuals. Some form of collective relationship between management and men is indispensable. The recognition of this principle by the Government should form an accepted part of the labor policy of the Nation.
>
> 3. Law, in business as elsewhere, depends for its vitality upon steady enforcement. Instead of waiting for adjustment after grievances come to the surface there is needed the establishment of continuous administrative machinery for the orderly disposition of industrial issues and the avoidance of an atmosphere of contention and the waste of disturbances.
>
> 4. The eight-hour day is an established policy of the country; experience has proved justification of the principle also in war times. Provision must, of course, be made for longer hours in case of emergencies. Labor will readily meet this requirement if its misuse is guarded against by appropriate overtime payments.
>
> 5. Unified direction of the labor administration of the United States for the period of the war should be established. At present there is an unrelated number of separate committees, boards, agencies, and departments having fragmentary and conflicting jurisdiction over the labor problems raised by the war. A single-headed administration is needed, with full power to determine and establish the necessary administrative structure. (Since this report was written the direction of the labor administration for the war was delegated to the Secretary of Labor.)
>
> 6. When assured of sound labor conditions and effective means for the just redress of grievances that may arise, labor in its turn should surrender all practices which tend to restrict maximum efficiency.
>
> 7. Uncorrected evils are the greatest provocative to extremist propaganda, and their correction in itself would be the best counter propaganda. But there is need for more affirmative education. There has been too little

> publicity of an educative sort in regard to labor's relation to the war. The purposes of the Government and the methods by which it is pursuing them should be brought home to the fuller understanding of labor. Labor has most at stake in this war, and it will eagerly devote its all if only it be treated with confidence and understanding, subject neither to indulgence nor neglect, but dealt with as a part of the citizenship of the State.

In the meantime the President had created the office of Labor Administrator and had appointed Secretary of Labor W. B. Wilson to fill this position. To coordinate efforts for harmony in labor matters and secure united support for the Labor Administrator, the President provided for the appointment of a War Labor Conference Board. He invited the National Industrial Conference Board to nominate five employer representatives and the American Federation of Labor to nominate five labor representatives. Each group appointed one representative of the public, the employers' nomination being Ex-President William H. Taft, and the labor nominee being Mr. Frank P. Walsh. This Board drew up a statement of principles and recommendations. To carry these into effect President Wilson appointed a National War Labor Board, composed of the same persons that had made up the War Labor Conference Board.

The National War Labor Board embarked on a comprehensive program of mediation and negotiation of industrial disputes and met with considerable success in composing differences. When such methods were unsuccessful, the Board constituted itself an arbitration commission, making awards by unanimous decision. When unanimity could not be secured, a special umpire was appointed by the President. The Board handled a large number of cases and in over 125 cases provided for the formation of shop committees or works councils as an alternative to union agreements in order to provide machinery for collective negotiation. The Board ceased to function shortly after the Armistice.

In addition to general agencies for mediation and the settlement of labor controversies, many special agencies were created to deal with labor conditions in specific fields. Mention of some of these will indicate how extensive were government efforts to bring about harmony in labor relations. They included: Shipbuilding Labor Adjustment Board; Industrial Relations Division Emergency Fleet Corporation; Marine and Dock Industrial Relations Division; Emergency Construction Adjustment Commission; Board of Control for Labor Standards in Army Clothing; National Harness and Saddlery Adjustment Commission; Arsenal and Navy Yard Wage Commission; and others. The significant point is that the failure of employers and labor to settle their differences on a mutually satisfactory basis made government intervention necessary in order to assure adequate production for war purposes.

Comparison of Conditions Now with Those in 1914-1918

When the attempt is made to draw from the experience of 1914–1918 lessons that may well be borne in mind today it is first of all apparent that some of the most persistent causes of dissension at that time either no longer exist or are of greatly reduced significance. To mention a few of these:

1. Wages in 1914 were at very low levels. Today, wage scales in the important industries that would be primarily affected by war orders are double or treble the 1914 figures.
2. One of the foremost demands of labor in the former war period was the 8-hour day, by which was meant the 48-hour week. Today, the 40-hour week is almost standard throughout the country.
3. During the World War organized labor fought bitterly for recognition and for the right to organize, and these efforts were vigorously resisted by most employers. Today, the right of labor to organize and bargain collectively if it so desires is recognized by United States statute, and this right is implemented by national and state boards whose duty it is to see that labor's rights are protected.
4. A common complaint during the World War labor controversies was that grievances were ignored. Today, on a wide scale comprehensive machinery for the adjustment of grievances is provided for in agreements with organized labor or independent unions, and frequently where labor is not organized grievance procedure has been set up as a feature of company practice.

Neither then nor now, however, has there existed an organized, effective, moral force of public opinion to police the enforcement of high standards of labor relations in industrial establishments, large and small; to forbid employers to exploit or take advantage of labor and to forbid labor to use unethical methods in securing union members, or to restrict output because labor shortage temporarily forced the relaxation of ordinary shop discipline.

While some of the causes of labor unrest in the period 1914–1918 have been mitigated in the intervening years, others may easily recur unless steps are taken to control them.

It is true that wage scales today are high. It is well recognized, however, that it is the purchasing power of wages, or wages in relation to living costs, that determine the wage earner's ability to maintain himself and his family. For present wage scales to remain adequate it requires that there be no substantial increases in living costs. If living costs increase, demands for higher wages are inevitable. There are indications that sudden and substantial increases in living costs, if they occur, will be carefully scrutinized and possibly regulated, which will tend to keep price increases affecting the cost of living within reasonable proportions and retard the precipitous increase that occurred in the last war. Still, a general rise in prices at such a time is normal and to be expected, and it is not too early to give thoughtful consideration to the determination of a machinery for adjusting wage controversies, a machinery that will command the respect and confidence of managements and employees alike, and, therefore, be able to substitute amicable settlements for long drawn out and costly disagreements or government intervention.

One troublesome problem of the last war seems likely to be repeated, and if the United States also enters the war it may assume serious proportions. This is the problem of a skilled labor shortage. It was the cause of much difficulty in securing adequate production in 1917 and 1918 when the supply of skilled European mechanics, who for years had come to the United States in large numbers, had only recently been cut off. The situation at present is that not only has the immigration of skilled European labor been held to small proportions for the past twenty-five years, but, because of the long depression and the suspension or sharp curtailment of many company training programs, the supply of skilled labor that has been trained in this country is far short of what will probably be needed.

In 1935 and again in 1937 The Conference Board conducted surveys to determine whether or not shortages were developing in the skilled trades, particularly in the metal manufacturing industries. Companies were asked to indicate by occupation how many skilled workers they would employ if they were available. In 1935 the total shortage amounted to 1.04% of all workers employed by the companies covered in the survey, both those that reported skilled labor shortages and those that did not. In 1937 this percentage had increased to 1.53.

These shortages developed during periods of very moderate increase in industrial activity. It does not require a vivid imagination to picture something of the situation that will develop if a large volume of foreign orders for munitions combines with the domestic demand which will be directly or indirectly stimulated by these foreign orders, and when, in addition, the greatly expanded naval construction program will draw into shipbuilding large numbers of skilled mechanics. It is important to note, also, that the largest shortages reported in 1937 were in occupations that would play an important part in the manufacture of munitions and in naval construction and arsenal work, such as all-around machinists, assemblers and erectors, boring machine operators, grinders, lathe operators, molders, pattern makers, screw machine operators, tool and die makers, and special machine tool operators.

Here is a problem that would seem to merit immediate and effective attack by industries that are likely to feel the crippling effects of an almost inevitable shortage of skilled labor.[1] It is not a problem about which corrective action can be deferred until a crisis actually develops because adequate training requires time. If a skilled labor shortage can be prevented from reaching acute proportions during the present war, other ills that follow in its train and that so seriously complicated the last period of war activity may be held within reasonable bounds.

It should be remembered that little help can be expected from the large body of the unemployed. Many men on government relief projects can undoubtedly be absorbed into war work, but they are not, for the most part, the type of labor that will be particularly needed when industry's work program is substantially expanded. Most of the highly skilled men were long ago absorbed into industry. Moreover, the number of the highly skilled regulates the volume of production and also the number of semi-skilled that can be employed. Skilled operations often constitute a bottleneck in the production line, and output and employment can be expanded only in proportion to the availability of skilled craftsmen able to perform the vital operations. There is no insurance against retardation of production in mere quantity of labor available. Adequacy of the supply of the necessary types of skilled men will determine whether American industry can meet the demands likely to be made on it.

As this second great war opens America industry is in a much better position to keep itself on an even keel, in so far as labor problems are concerned, than was the case twenty-five years ago. This is true because the mistakes made and the working at cross purposes so common in the last war are still fresh in the memories of many of the present generation of executives, and because considerable progress has been made during the intervening period toward the solution of some of the most persistent causes of management–labor contention. But eventual success in avoiding serious labor difficulties will depend to a considerable extent on whether there is a tendency on the part of management to assume that everything will be all right because basic factors are favorable, and, therefore, let matters take their course, or whether management is alive to the possibilities for trouble that are always latent in a situation such as the present one and prepares intelligently and constructively to see that from the start causes of trouble are not allowed to develop to serious proportions. The latter course will be only a continuation of what in countless instances has been proved to be sound practice in industrial relations under all conditions.

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[1] In this connection, methods described in the following article in this issue may be of interest.

Intensive Short-Period Training

An increasing demand for a product naturally results in an increasing demand for skilled labor. If the rise in production is gradual over a period of years, the need can be met by increasing the number of apprentices in the long-term trade training programs. But if the business curve rises too abruptly to permit a three or four-year period of preparation, the demand for skilled men must be met through a training procedure that both accelerates the speed of individual learning and accommodates large numbers of trainees through its flexibility. The sharp rise in production schedules foreshadowed by present world conditions will create demands for skilled men that will be unusually difficult to meet since they come at the end of a ten-year period during which companies have trained as few men as possible. In order to find a parallel to the situation in which industry may easily find itself one must go back to 1917—to the period when the United States entered the World War.

Wartime Training of Technicians

The Army made sudden and heavy demands upon the country's supply of technicians. For example, each combat division of 36,000 men required 691 chauffeurs (auto and truck), 360 telephone repairmen, 167 mechanics, 163 telegraphers, 156 radio operators, 151 carpenters, 142 linemen, 128 tractor operators, 128 machinists, 122 truck masters, 78 auto mechanics, 67 blacksmiths, 64 mechanical draftsmen, 63 electricians, 52 leather and canvas workers, 29 switchboard operators, and a lesser number for each of 68 additional trades. This need had to be met, but at the same time it was vital to avoid stripping the home industries of the skilled men necessary to maintain the capacity production schedules created by war demands. It was quickly apparent that the Selective Service Act was not going to furnish sufficient trade specialists, and if Army needs were to be met, a national agency for skill training had to be organized.

In February, 1918, the War Department organized a Committee on Education and Special Training, headed by Dr. C. R. Mann, Chairman of the Advisory Board, charging it with the responsibility of studying the Army's needs, obtaining the cooperation of educational institutions, and administering the programs of intensive short-period training. By coordinating the work of 155 educational institutions and by developing material for high-speed intensive techniques, the committee, during the six months preceding the Armistice, trained 146,959 men in 62 different trades, and had contracted for the training of 222,893 additional men.

While the war atmosphere undoubtedly stimulated in the trainees a greater willingness to learn than is normally found in peacetime industry, the training methods developed by Mr. C. R. Dooley and his associates contain hints on technique that will be valuable to companies in which production demands force the introduction of intensive short-period training programs.

As one examines these methods and attempts to see how the techniques would be applicable to the specific needs of a particular plant, it is essential to remember that this is a method that was created by emergency conditions rather than a substitute for long-term apprenticeship. When business increases at an abnormal rate, producing an acute shortage of skilled labor, normal training standards can no longer function. Wages for skilled labor rise sharply, and men who have even an elementary grasp of the fundamentals of a trade are in demand. Four-year apprentice courses disappear both because the company itself needs the men quickly, and because the acute labor shortage opens to the trainee highly remunerative opportunities in other companies as soon as his preliminary period of training is completed. In such a situation the problem is not to produce a few broadly skilled craftsmen, but to train large numbers of specialists under the pressure of an immediate need that must be evaluated by other standards than those which can be maintained under peacetime conditions. It is no longer a question of using the ideal methods from a long-time point of view, but one of finding techniques that will answer immediate needs quickly. Yet these principles adapted to short-period training contain certain elements that designers of long-term plans might do well to consider.

Principles of Short-Period Training

The following principles of short-period training, drawn from the methods of the War Department's Committee on Education and Special Training, are those upon which industry's leaders may be forced to build their skill-training programs in the near future:

Define and keep up-to-date the specific requirements of all jobs to be filled

The first step taken by the committee was to discover the needs of each unit in terms of the number required in each trade and the differences in the type of work required by the various Corps. A subcommittee on Army needs was appointed whose full-time work was to supply information to the training centers on operation requirements and to assist in the placement of trained men. One of its duties was to keep up-to-date statistics of Army requisitions for specific types of men and of dates on which the schools could supply trained men. While this quantitative side of the work was going forward, another section of the committee on Army needs travelled constantly, visiting both schools and Army Corps in an effort to create a clear understanding between the two groups. Conferences were planned between the training men and the Army so that a direct and clear interpretation could be given the teaching staffs of the exact requirements for successful performance in the technical trades of the fighting forces.

The importance of this kind of coordination will not be underestimated by anyone who has been associated with a large industrial staff school in a period of prosperity. Under heavy production pressure conditions change rapidly. Short-period training necessitates a high degree of specialization. Without a continuous flow of accurate information between the operating supervision and the teaching staff, the schools may very quickly find themselves graduating men fitted to do work that is no longer a part of the production process. This kind of training obsolescence has been apparent for years in the college-industrial relationships in which no method of liaison has been developed. If in such long-time educational procedure this is dangerous, in a short-period program the failure to provide a means of close coordination between training and operating units results in a complete failure of training efforts and a breakdown of production due to a shortage of skilled workers. It follows that an efficient coordinating agency not only increases training effectiveness and production efficiency, but is essential to the program's success.

Train in a Staff School

In long-time programs for the development of trade skills, there are definite advantages to decentralized training in the plant shops under the direction of the line supervision. But to gain the intensity of training that makes it possible to graduate well-trained men in a short period of time, it is necessary to concentrate all the equipment and instructors in one place. In this way supervisory help is available to the trainee exactly when he needs it, loss of time is avoided in transfer to new work, and group instruction can be given quickly in the workroom. Usually the same conditions which make quick training necessary also increase the number of trainees needed, so that the existence of a staff school is economically sound.

The size of the schools that cooperated in the plans of the wartime committee varied enormously, as did the standards of instruction that it was possible to maintain. Both these variants affected the ratio of students to instructor, but in general the intense nature of the work made it desirable to keep the ratio as near 10 or 15 to 1 as possible. To maintain an equal standard of supervision with trainees scattered throughout a plant would have meant such an increase in the number of instructors as to be prohibitive. At the same time, the presence of trainees and their supervisors on the floor of production shops would undoubtedly have decreased the department's efficiency as much as it hindered the learner's progress. From all points of view staff schools were the logical media for the program, and were the only ones used.

Provide instructors with uniform written descriptions of procedure

It is not possible in an emergency program to obtain enough experienced instructors to fill the teaching positions. Obviously, it is difficult if not impossible to spend the time instructing instructors when unusual demands for the trade training are being answered. Responsibility for instruction must therefore be given to men whose background consists largely of actual practice of a trade. In undertaking to teach their trade, then, they need as much help in the techniques of teaching as it is possible to give them. The committee discovered that a high standard of instruction could be maintained if clear, uniform and detailed written descriptions of instruction procedure were supplied in connection with each trade. Manuals were issued for every type of work and the first two sections of each were designed to aid the instructor.

The general nature of the instructor guidance is indicated by the following outline of the material given to teachers of sheet metal workers:

> Part I—An explanation of the work which these specialists will be required to perform in the various branches of the Army: base repair shops, mobile repair shops, quartermaster service, artillery service, etc. The actual work to be done is described in connection with each so that the instructor can point the training of each trainee to a specific Army job.
>
> Part II—A description of the training procedure, and a discussion in detail of the method, giving a general outline of theory to be explained, indicating the best ways of planning schedules for various types of individuals and explaining the use of the job sheets that comprise the third section of the manual.
>
> Part III—Equipment. A detailed description of all tools needed in the training are listed; pictures illustrate a typical sheet shop, hand tools, and layout of benches for drafting, brazing and soldering. A bibliography of books and catalogues giving sheet metal trade information concludes the section.

This material made it possible to establish a standard method of instruction simple enough to be handled by leaders with comparatively little teaching experience, yet capable of producing men qualified to do specific production jobs.

Reduce classroom work to a minimum; train on the job

While the necessity of giving some of the essential theory in classes was recognized, it was urged that this be reduced to the minimum. The following excerpts from the teacher's section of the instruction manual indicate the type of material taught in the sheet metal course and suggestions about its utilization.

> In all cases the soldier should learn by doing. He should not be expected to obtain important information from

lectures. Accordingly, the work should consist of a maximum of shop or laboratory work in which he is assigned to specific tasks. In general, not more than three hours a week of formal lecture work should be given and the lectures should deal principally with the tools, tool operations, machines, materials and new principles of the jobs worked on during the week. These lectures should be divided under four heads as follows:

1. Equipment for sheet metal shop, materials, care of equipment, use of catalogues, cylindrical articles, conical articles and intersections.
2. The soldering of copper, fluxes, solder, preparation of materials to be soldered, materials used in soldering, and the auto radiator.
3. Laying out, cutting, seaming, making of joints, wiring, riveting, use of various tools and machines.
4. Brazing (with gas torch, gasoline and kerosene torches), oxy-acetylene welding of various metals.

Supplementary to these lectures, short demonstrations, discussions and conferences should be given to small groups before a blackboard set up in the shop.

In addition to this work, a schedule known as the "Evening Study Program" should be prepared as follows:

1. *Drawing* 2 hrs. per week	Principles of Mechanical Drawing Sketching and Mathematics as applied to Sheet Metal Work
2. *Sheet Metal* 2 hrs. per week	Study of Mimeographed Sheets Catalogues on Materials Principles, Tools and Equipment for Sheet Metal Work
3. *Brazing and Welding.* 1 hr. per week	Study of Sheets on Brazing and Oxy-Acetylene Welding

Train the man well in part of a trade

The committee recognized that it must avoid the error that had led to the failure of so many short-period training programs which attempted to teach a man in eight weeks the breadth of skill he would normally attain in three or four years. It was possible, however, to narrow the field of learning and by intensive methods to make him a skilled worker in part of a trade. Flexible outlines were therefore provided which the instructor could adapt to the individual's abilities so that his training could be aimed at mastering the most complex job that he could learn to do well in eight weeks. As a result of this method the committee found almost no men who upon graduation were not fitted to do skilled work effectively in some phase of their trade.

Base the individual's training schedule on his experience

In programs that extend over some years, the trainees are selected on the basis of their mechanical aptitude and all are then given the same course, which is planned to produce well-rounded craftsmen. In an emergency procedure, the training must start at whatever point of development each man has reached, and carry him on as far as possible in the time available. To do this effectively, the committee suggested that each new trainee should fill out a questionnaire designed to indicate the degree of skill he had already attained. On the basis of the answers the group was split into three divisions for men with no, with little, or with considerable experience. Each of these divisions was assigned a job which the questionnaires indicated its members should be able to do. The way in which each man approached the work and completed the task gave an objective indication of his ability. As this test was being given, each man was called to a blackboard and questioned concerning the fundamental principles underlying the particular job on which he was engaged. The results of these tests of job performance and job knowledge gave an adequate basis for planning the individual work schedules.

The general pattern for all the schedules of the sheet metal trainees reflects the fact that it is possible to train more intensely if the type of work is changed every few hours. The suggestions given to the instructor in regard to the designing of schedules were as follows:

> Prepare a schedule similar to the following: Divide the working day (6 hours) into four equal periods. Divide the various subjects as laid out in the manual among these periods as follows:

1st Period *Drawing*, etc.	Drawing Questions Demonstrations Lectures Mathematics
2nd and 3rd Periods *Sheet Metal Work*	Laying out Work in the Shop Cutting, Fitting Soldering, Riveting Auto Radiator Repair and Corrugated Iron Work Questions, Demonstrations of the Problems Blackboard Shop Talks
4th Period *Allied Jobs*	Wire Work Brazing Oxy-Acetylene Welding Working Angle-Iron Channels, etc. Demonstrations and Questions Blackboard Shop Talks

Into this flexible general plan could be fitted whatever work schedule would most effectively bring the individual to the highest peak of skill development which he could attain in the allotted time.

Break the skill to be learned into a series of jobs of increasing difficulty

The basic principle of learning through doing was applied to all of the committee's work by progression through a series of jobs of increasing difficulty. In order to standardize the content of all the courses sufficiently to make effective placement possible, it was necessary to define each of the series of jobs through which the students were to progress. The sum total of the skill involved in the series would be the equivalent of the skill essential to effective performance in the most difficult type of work the Army would request of any specialist in a particular trade. To form the series, then, it was necessary to analyze the maximum production needs in every trade in terms of skill and then describe a number of individual jobs, the mastery of which would fit the trainee to handle the Army's most complex work in his trade. After the jobs were defined they could be arranged in the order of increasing difficulty to permit a gradual skill development by learning through doing.

Once the elements of this series were defined, the committee had material for distribution that was valuable for a number of reasons. Any new man could be given a job from the series, requiring a skill equivalent to his stated ability. If a good performance verified his statement of experience, his work schedule automatically started with the next job problem in the series that he could solve with his already acquired experience, plus a little new knowledge and new skill. Not only was it possible to start each man at his correct level, but the series could be adjusted to each individual's speed of learning by including all the progressive steps in the schedule of the slow learner and omitting some from that of the man who learned quickly. Furthermore, it was possible to adjust the schedule so an increase or a decrease in the learning rate could be made at any time during the process. In other words, the job series permitted the instructor to rate a man's ability objectively, start him from "where he was" and take him as far as he could go in eight weeks.

The progressive series offered the additional advantage of reducing the time required for both individual and group instruction since each job trained the man for the one immediately following. Since the conditions which require an emergency program reduce the number of available experienced teachers in proportion to the number of the trainees, any procedure which decreases the number of instructors required automatically raises both the average quality and the speed of instruction at the same time that it lowers the cost in terms of salaries and waste.

The following list of job titles from the sheet metal course indicates the general nature of the job series planned for all the trades.

To Make the Following

Job No.

10. A stove pipe collar
11. A circular pan
12. A tin cup
13. A pan–riveted corners
14. A pan–solid corners
15. A flaring pan
16. A conductor elbow
17. A funnel
18. A gutter mitre and conductor socket

Job No.

19. A measure
20. A single pitchroof flange
21. A roof ridge flange
22. A flaring roof flange
23. A "T" joint
24. A "Y" joint
25. A three-piece elbow
26. A four-piece elbow
27. A rectangular elbow

In summary then, training through job progression because of its elements of flexibility and self-learning provided uniform training without establishing a rigid standard that was not adaptable to the individual. It gave inexperienced instructors a simple teaching guide, and achieved the highest standards of instruction possible at the lowest cost by keeping the student-teacher ratio to a minimum.

Give the trainee clear, concise descriptions of each job and check his understanding of the work by questions

The committee recognized that the key to the problem of stimulating self-learning and decreasing supervisory time would be in making the trainee understand clearly what he was to do and why he was to do it, in connection with each type of work. Since after training the men would be working in emergency situations in which the ideal tools and materials would not be available, it was essential to develop their powers of imagination and creative thinking to as high a degree as possible. To meet this need, job sheets were designed for each job in the progression series. In the sheet metal course, each work sheet included the following:

1. A photograph of the completed job
2. A dimensioned elevation drawing of the job
3. A statement of the required drawings and layout
4. Questions as to problems underlying the principles involved in making the drawings and layout
5. A statement of the required job
6. Questions on principles underlying the tool and machine operations
7. Questions on tools, machines and equipment used

The following material for Job No. 24 of the sheet metal course is typical.

PHOTOGRAPH
OF
FINISHED PRODUCT

A "Y" JOINT

ELEVATION
DRAWING
OF "Y" JOINT
WITH DIMENSIONS

Make a "Y" joint or angular intersection according to the following directions:

Make drawings showing elevation and stretchout for the angular intersection or joint shown above.

1. In what way does this job differ from the previous one?
2. In the stretchout for vertical section where should the center line of the hole be placed?
3. Tell how layout for hole should be found.
4. How will you get the stretchout for clinching strip?
5. What is a clinching strip used for?
6. In making a joint of this kind for a conductor would a clinching strip be used?
7. Why should you be very careful in making layout for this job?

Make the "Y" joint or angular intersection shown above using your drawings to work from.

8. Tell just how you would lay this job out on the metal.
9. In cutting hole in vertical section what tools should be used?
10. How should edges be turned on angular section?
11. Which section should the clinching strip be riveted to?
12. If you were called upon to make a connection like this on a job already installed, how would you make layout for opening?
13. Name some uses for a joint of this kind.
14. Why should edge on angular piece be turned?
15. What machine should be used?

The use of the material was discussed in the instructor's manuals.

> When a soldier is assigned a job he should be handed a job sheet and given an opportunity to study it in order to approach his work intelligently. In every case the problem involves some new phase of layout of manufacturing operation. Care should be taken to see that the trainee does take time to read the job sheet carefully in order to gain a full understanding of the new work. The job sheet will form the basis for all lectures, demonstrations, questions and class discussions. It will be of great assistance to the soldier in taking notes during lectures and discussions, and should be saved as reference material for his later work.
>
> The instructor should avoid giving the soldier a direct answer to the job sheet questions, but in every case where it is possible, he should try to stimulate the man's ingenuity and reasoning power by showing him that the necessary information is often at hand in the blue print, the machine itself, or the tools being used. The trainee should be encouraged to think through to the answer of all of his problems. However, the utmost care should be taken to see that he finally has the correct answer to each question on the sheet. A good way to check this is to gather a small group around the blackboard in the shop and conduct an informal conference on the particular job. It will be found that the men will gain much information from each other and their disagreements will both stimulate creative thought and tend to fix in their minds the points discussed. It is much better for the instructor to act as a last court of appeal in these discussions, rather than as a source of information. The ideal instructor is not the one who simply tells his material to a class, but is the one who directs his trainees so that by their own efforts they will gain the greatest amount of practical skill and accurate job knowledge."

Conclusion

In summing up the principles underlying this program, Mr. Dooley wrote:

> A promotion program is preferable to a rotating one. It is not desirable to follow rigidly a plan which provides that all students get a definite length of time on each of a number of specified subjects in rotation, though such a program may be suited to the most able men.
>
> The work should be organized so that while the most able men will get the entire course of instruction, others will omit those subjects for which they have no special aptitude, giving full time and attention to those things in which they show promise of success. In general this means a course arranged not for the average but for the best student and then administered so that only those men who show or develop ability on one job will be promoted to the next more difficult task.
>
> To illustrate: In the auto-mechanics squad only those men who have thoroughly mastered the details of the axle and wheel work will progress to engine work, and then again only those who show a good understanding of engine performance will take up further study of gas engine repairing. Again, only those who show special all-around ability in these things will proceed further with the study of ignition, timing and the more complex details of operation.
>
> In a given course all men need not start on the same job and all those promoted need not take up the same advanced work. There are several points in each course where men may be started. Obviously a man's first job should be of sufficient simplicity for him to proceed intelligently. All jobs should be reasonably sequential and should present real problems, the working out of which will equip the men with first hand knowledge of practical details of construction or operation and provide a background for the understanding of scientific principles. The important factor in shifting men from one job to the next is that the instructor maintain the idea and spirit of promotion as to both practical accomplishment and understanding of fundamental principles. In short the educational program all the way through shall present an opportunity for native ability and previous experience to assert itself, and train men along the lines they are fitted to go and only as far as they can make real progress. At the end of the course each man will be rated, not on his average proficiency in all the work, but by listing the kinds of work he can do well.
>
> In order to provide for the development of originality, initiative and real thinking power, and also to prevent learning by rule-of-thumb, the teaching should be almost entirely through jobs, questions, problems and guided discussions.
>
> These course outlines are not intended for the schoolroom but for the shop where they can be used for the guidance of the instructors and the men on the job. The frequent gathering of the men in small groups before a blackboard in the shop where live material is available for demonstration, discussion and conference is far preferable to the practice of formal lectures to large groups.
>
> The accomplishment of a job is both the end to be attained and the means for instruction.

In the years since the close of the World War, various companies have developed methods of short-period training, some of which are described in the current training studies of THE CONFERENCE BOARD. The more recent programs have made use of motion analysis to break down operations into single movements so that they may be more quickly learned. Colored motion study slides as an instruction medium have proved to be of value where the colors accentuated the difference between materials or gave a better perspective that clarified the operation to the observer. Further experimentation is being made along the lines of training by job progression and of self-teaching through observational questionnaires. Much work has been done in the intervening twenty years, but for large-scale application of the basic principles, the work of this war committee is still the best source of information. As increasing production demands create a shortage of skilled labor and force the introduction of short-period programs of intensive training, industry will find the techniques developed by Mr. Dooley and his associates of real value.

MARTIN S. FIRTH
Management Research Division

Chronology of Events Affecting Labor Relations September, 1939

September

1 *War Becomes Labor Factor*—C.I.O.'s National Maritime Union demands from American shipowners $25,000 war risk insurance, a bonus of $250 per month, and wage increase of 40% for unlicensed personnel on ships entering war or danger zones in Europe.

Independent Unions Criticize N.L.R.B.—Counsel for National Council of Independent Unions accuses N.L.R.B. before Senate Labor Committee of deliberately seeking to destroy independent unions.

3 *Strikes Decline*—N.L.R.B. announces that monthly average number of all strikes in first seven months of 1939 was 192, compared with 231 in 1938 and 395 in 1937. Strikes caused by organizational difficulties in the first five months of 1939 numbered 98, compared with a monthly average of 114 for the full year of 1938 and 228 for the full year of 1937, according to Bureau of Labor Statistics.

6 *Wage-Hour Force Enlarged*—Wage-Hour Administration announces addition of 400 new inspectors to the field force to assist employers in complying with the overtime pay requirements of the Fair Labor Standards Act.

7 *Minimum Wage Recommended*—The industry committee for the hat industry recommends establishment of 35 cents as minimum wage for straw and harvest hat branch, and 40 cents for the fur felt, wool felt, hatters fur, and silk and opera hat branches of the industry.

10 *Wage Demand in Offing*—United Textile Workers of America (A.F.L.) announces that it will demand increase in wages sufficient to meet rising cost of living.

11 *Merger Proposal Rejected*—Commercial Telegraphers Union (A.F.L.) rejects merger proposed by American Communications Association (C.I.O.)

New Unions' Rights Upheld—New York Supreme Court Justice Bergan rules that opposition of existing labor unions is no bar to the organization of new unions in approving certificate of incorporation of the Associated Welders in Buffalo and Erie County. Such action had been opposed by State board and by building trades labor organizations on ground that incorporation of new union would be likely to increase jurisdictional difficulties.

13 *Employment and Wages Rise*—New York State Industrial Commissioner reports increase of 2.9% in employment and 4.2% in payrolls during August, as compared with July.

Textile Industry Minimum Wage—Wage-Hour Administrator announces minimum of 32½ cents for workers in textile industry, effective October 24.

14 *Bridges Case Closes*—Hearings on the proposed deportation of Harry Bridges, Australian-born Pacific Coast labor leader, come to a close after ten weeks of taking testimony. Special Examiner James M. Landis will examine 8,000 pages of proceedings containing about 2½ million words before making his report to the Secretary of Labor.

15 *C.I.O. Wins Auto Election*—In elections conducted by N.L.R.B. in plants of Briggs Manufacturing Company, C.I.O. receives more than 90% of the votes cast in six Detroit plants.

17 *Union Election Results*—New York State Labor Relations Board reports that in first eight months of year C.I.O. unions won 26 and lost 32 elections, while A.F.L. won 61 and lost 42. In direct contests between the two, C.I.O. won 7–to–1.

18 *W.P.A. Cuts Overhead*—W.P.A. Administrator reports dropping 22% of administrative employees of the W.P.A. Such employees totaled 24,326 on September 1, compared with 31,506 at the beginning of July.

20 *Committee Begins Inquiry*—Special House committee investigating N.L.R.B. reports mailing 60,000 questionnaires to employers and union organizations as its first definite move toward securing information.

21 *N.L.R.B. Splits on Important Point*—By two–to–one vote N.L.R.B. requires Pittsburgh Plate Glass Company to bargain with C.I.O. in six plants. In five plants C.I.O. has majority and company deals with it. In sixth plant it does not possess majority, but two members of Board require that C.I.O. be recognized. In important dissenting opinion, Dr. Leiserson says: "This does not seem essentially different from the denial of free choice of representatives in cases where employers impose labor organizations on their employees."

Wages and the Cost of Living

MANUFACTURING ACTIVITY showed general improvement in August according to reports received by THE CONFERENCE BOARD from manufacturers in the 25 industries covered in its regular monthly survey.

MAN HOURS WORKED

Total man hours worked were 2.5% higher in August than in July owing to increases in the number of workers employed and in the average number of hours worked per week. Increases were reported in 17 of the 25 industries, the largest, 24.4%, in the silk industry, followed by one of 18.2% in the iron and steel industry. In the agricultural implement and lumber and mill work industries, however, there were decreases of 5.8% and 5.6%, respectively. Total man hours in the 25 industries combined were 18.6% higher than a year ago, but 34.6% lower than in 1929.

EARNINGS AND HOURS, ALL WAGE EARNERS

AUGUST, 1939

INDUSTRY	Average Earnings				Average Hours per Week per Wage Earner			
	Hourly		Weekly		Actual		Nominal	
	August	July	August	July	August	July	August	July
Agricultural implement	$.806	$.804	$29.84	$30.89	37.0	38.4	40.2	40.2
Automobile[1]	.971	.957[r]	36.32	31.81[r]	37.4	33.2[r]	40.0	40.0
Boot and shoe	.509	.506	19.28	19.05	37.9	37.6	40.3	40.3
Chemical	.757	.763	29.43	29.50	38.9	38.7	40.2	40.2
Cotton—North	.489	.485	18.21	17.97	37.3	37.1	39.9	39.9
Electrical manufacturing	.792	.797	30.25	30.53	38.2	38.3	39.8	39.9
Furniture[2]	.662	.666	25.79	25.15	39.0	37.7	40.9	40.9
Hosiery and knit goods	.545	.544	20.47	19.65	37.5	36.1	40.0	40.0
Iron and steel[3]	.860	.859	31.13	26.63	36.2	31.0	40.2	40.2
Leather tanning and finishing	.643	.641	24.77	24.36	38.5	38.0	40.2	40.3
Lumber and millwork	.666	.679	25.66	27.87	38.5	41.0	42.0	42.0
Meat packing	.698	.695	27.90	28.82	40.0	41.5	40.4	40.5
Paint and varnish	.718	.721	29.48	29.56	41.1	41.0	40.6	40.6
Paper and pulp	.641	.641	25.49	25.31	39.8	39.5	41.0	41.2
Paper products	.609	.613	24.02	24.30	39.4	39.6	40.4	40.4
Printing—book and job	.811	.837	32.05	32.26	39.5	38.5	40.0	40.0
Printing—news and magazine	.963	.973	35.11	35.22	36.5	36.2	39.7	39.7
Rubber	.875	.866	31.40	30.21	35.9	34.9	38.3	38.1
1. Rubber tires and tubes	1.014	1.009	36.88	35.40	36.4	35.1	37.4	37.1
2. Other rubber products	.693	.685	24.43	23.69	35.3	34.6	39.4	39.4
Silk	.509	.516	18.40	17.31	36.1	33.5	40.2	40.2
Wool	.596	.587	21.20	20.67	35.6	35.2	40.2	40.3
Foundries and machine shops	.736	.736	28.39	28.28	38.6	38.4	40.3	40.2
1. Foundries	.746	.747	26.40	26.01	35.4	34.8	40.2	40.2
2. Machines and machine tools	.747	.751	31.12	31.20	41.7	41.5	41.2	41.0
3. Heavy equipment	.777	.778	29.78	29.95	38.3	38.5	40.1	40.1
4. Hardware and small parts	.663	.660	25.49	25.41	38.4	38.5	40.3	40.4
5. Other products	.739	.735	28.25	27.74	38.2	37.8	39.7	39.7
25 INDUSTRIES	$.721	$.721[r]	$27.32	$26.64[r]	37.9	37.1[r]	40.3	40.3
Cement	$.691	$.694	$26.97	$27.15	39.0	39.1	39.4	39.3
Petroleum refining	.979	.985	34.97	35.78	35.7	36.3	36.0	36.0
27 INDUSTRIES	$.724	$.725	$27.41	$26.76[r]	37.9	37.1[r]	40.3	40.3

NOTE: The wage data here given are for cash payments only and do not take into consideration the value of such wage equivalents as reduced or free house rents or other special services rendered by the company to employees. Various forms of wage equivalents are in use in industrial establishments in many localities, but the part which they play as compensation for work performed cannot be taken into account in a study of this character.

[1] Based on data collected by the Automobile Manufacturers Association and THE CONFERENCE BOARD.

[2] Includes wood, metal, and upholstered household and office furniture.

[3] Based on data collected by the American Iron and Steel Institute and THE CONFERENCE BOARD.

[r] Revised.

CHANGES IN THE COST OF LIVING, AUGUST, 1939

Item	Relative Importance in Postwar Family Budget	Indexes, 1923=100			Percentage Changes	
		August, 1939	July, 1939	August, 1938	July, 1939 to August, 1939	August, 1938 to August, 1939
Food[1]	33	76.7	78.1	80.1	-1.8	-4.2
Housing	20	86.3	86.3	86.6	0	-0.3
Clothing	12	71.9	71.9	73.4	0	-2.0
Men's clothing		78.2	78.2	79.1	0	-1.1
Women's clothing		65.7	65.7	67.6	0	-2.8
Fuel and light	5	84.0	83.8	84.4	+0.2	-0.5
Coal		82.5	82.2	83.4	+0.4	-1.1
Gas and electricity		87.1	87.1	86.5	0	+0.7
Sundries	30	96.9	96.9	96.9	0	0
WEIGHTED AVERAGE OF ALL ITEMS	100	84.5	84.9	85.9	-0.5	-1.6
PURCHASING VALUE OF DOLLAR		118.3	117.8	116.4	-0.4	+1.6

[1] Based on food price indexes of the United States Bureau of Labor Statistics, August 15, 1939, July 18, 1939 and August 16, 1938.

INDEXES OF EARNINGS, EMPLOYMENT, MAN HOURS, AND PAYROLLS, ALL WAGE EARNERS

AUGUST, 1939

1923=100

INDUSTRY	Average Earnings						Employment		Total Man Hours Worked		Payrolls	
	Hourly, Actual		Weekly									
			Actual		Real							
	Aug.	July	Aug.	July	Aug.	July	Aug.	July	Aug.	July	Aug.	July
Agricultural implement	145.0	144.6	108.5	112.3	128.4	132.3	97.6	99.8	72.9	77.4	105.9	112.1
Automobile[1]	153.6	151.4[r]	120.5	105.5[r]	142.6	124.3[r]	63.1	69.6	49.5	48.4[r]	76.0	73.4[r]
Boot and shoe	102.8	102.2	85.3	84.3	100.9	99.3	96.1	95.6	79.9	78.9	82.0	80.6
Chemical	149.6	150.8	109.4	109.6	129.5	129.1	113.3	110.6	82.8	80.4	124.0	121.2
Cotton—North	109.9	109.0	85.7	84.6	101.4	99.6	42.4	41.6	33.1	32.3	36.3	35.2
Electrical manufacturing	139.4	140.3	111.7	112.7	132.2	132.7	84.6	83.8	67.6	67.1	94.5	94.4
Furniture[2]	128.0	128.8	103.4	100.8	122.4	118.7	79.7	78.6	64.5	61.5	82.4	79.2
Hosiery and knit goods	142.7	142.4	115.8	111.2	137.0	131.0	114.5	112.0	92.7	87.4	132.6	124.5
Iron and steel[3]	144.3	144.1	91.0	77.8	107.7	91.6	92.4	91.3	57.9	49.0	84.1	71.0
Leather tanning and finishing	132.3	131.9	107.0	105.2	126.6	123.9	81.8	81.9	66.2	65.4	87.5	86.2
Lumber and millwork	140.8	143.6	109.6	119.0	129.7	140.2	65.5	65.2	51.0	54.0	71.8	77.6
Meat packing	147.6	146.9	118.5	122.4	140.2	144.2	97.5	97.0	78.5	81.0	115.5	118.7
Paint and varnish	134.5	135.0	111.0	111.3	131.4	131.1	125.7	126.4	103.7	104.0	139.5	140.7
Paper and pulp	127.2	127.2	97.7	97.0	115.6	114.3	107.3	107.1	82.4	81.7	104.8	103.9
Paper products	133.6	134.4	110.3	111.6	130.5	131.4	127.7	128.3	105.7	106.7	140.9	143.2
Printing—book and job	124.2	128.2	107.0	107.7	126.6	126.9	100.6	101.5	86.6	85.2	107.6	109.3
Printing—news and magazine	139.0	140.4	112.4	112.8	133.0	132.9	114.7	114.8	93.0	92.3	128.9	129.5
Rubber	139.8	138.3	112.0	107.8	132.5	127.0	72.4	70.6	58.0	55.0	81.1	76.1
Silk	102.6	104.0	79.9	75.2	94.6	88.6	93.2	80.7	72.3	58.1	74.5	60.7
Wool	118.0	116.2	88.4	86.2	104.6	101.5	78.1	76.9	58.5	57.0	69.0	66.3
Foundries and machine shops	128.4	128.4	100.1	99.7	118.5	117.4	82.2	82.4	64.0	63.8	82.3	82.2
1. Foundries	126.4	126.6	89.2	87.8	105.6	103.4	60.0	61.1	42.3	42.3	53.5	53.6
2. Machines and machine tools	136.1	136.8	114.0	114.3	134.9	134.6	93.0	94.2	77.8	78.5	106.0	107.7
3. Heavy equipment	116.0	116.1	90.2	90.7	106.7	106.8	59.5	59.3	46.2	46.3	53.7	53.8
4. Hardware and small parts	129.5	128.9	102.7	102.4	121.5	120.6	98.6	96.1	78.1	76.3	101.3	98.4
5. Other products	132.0	131.3	103.4	101.5	122.4	119.6	94.6	95.3	74.1	73.9	97.8	96.7
25 INDUSTRIES	133.3	133.3[r]	102.7	100.1[r]	121.5	117.9[r]	84.3	84.0	64.9	63.3[r]	86.6	84.1[r]

NOTE: No basic 1923 data are available, hence no indexes are given for the following: rubber tires and tubes, other rubber products, cement, petroleum refining, and "27 industries."

[1] Based on data collected by the Automobile Manufacturers Association and THE CONFERENCE BOARD.

[2] Includes wood, metal, and upholstered household and office furniture.

[3] Based on data collected by the American Iron and Steel Institute and THE CONFERENCE BOARD.

[r] Revised.

EMPLOYMENT AND PAYROLLS

There were 0.4% more workers employed in August than in July, 11.4% more than in August, 1938, but 16.5% fewer than in 1929. Total payroll disbursements in August were 3.0% higher than in July, 20.9% higher than a year ago, and 20.1% lower than in 1929. The largest increases in total payroll disbursements between July and August were 22.7% in the silk industry, and 18.5% in the iron and steel industry.

HOURLY EARNINGS

Hourly earnings averaged 72.1 cents in both July and August. They were 1.0% higher than in 1938 and 22.2% higher than in 1929, when they averaged 59.0 cents.

AVERAGE WORK WEEK

The average number of hours worked per week increased from 37.1 hours in July to 37.9 hours in August, or 2.2%. The largest increases in the average work week were in the iron and steel industry, 16.8%, the automobile industry, 12.7%, and the silk industry, 7.8%. The average work week in the 25 industries combined was 6.8% higher than in August, 1938, but 21.5% lower than in 1929.

WEEKLY EARNINGS

Average weekly earnings increased from $26.64 in July to $27.32 in August, or 2.6%. Increases were reported in 14 of the 25 industries. The largest were 16.9% in the iron and steel industry, 14.2% in the auto-

EARNINGS AND HOURS, ALL MALE AND FEMALE WAGE EARNERS

AUGUST, 1939

INDUSTRY	ALL MALE						FEMALE					
	Average Earnings				Average Hours per Week per Wage Earner		Average Earnings				Average Hours per Week per Wage Earner	
	Hourly		Weekly				Hourly		Weekly			
	Aug.	July	Aug.	July	Aug.	July	Aug.	July	Aug.	July	Aug.	July
Agricultural implement	$.808	$.807	$29.94	$31.01	37.1	38.4	$.583	$.597	$20.95	$22.50	35.9	37.7
Automobile[1]	.983	.968[r]	36.76	32.23[r]	37.4	33.3[r]	.691	.695[r]	25.29	21.34[r]	36.6	30.7[r]
Boot and shoe	.576	.575	21.81	21.54	37.8	37.4	.412	.407	15.44	15.21	37.5	37.4
Chemical	.790	.797	30.82	30.85	39.0	38.7	.536	.535	20.75	20.61	38.7	38.5
Cotton—North	.527	.531	20.21	20.58	38.3	38.8	.418	.419	14.82	14.62	35.5	34.9
Electrical manufacturing	.850	.855	32.74	32.96	38.5	38.6	.561	.564	20.78	21.06	37.0	37.3
Furniture[2]	.673	.677	26.38	25.66	39.2	37.9	.486	.494	17.50	17.09	36.0	34.6
Hosiery and knit goods	.698	.697	27.56	27.08	39.5	38.8	.428	.430	15.72	15.71	36.8	36.5
Iron and steel[3]	.860	.859	31.13	26.63	36.2	31.0	....	....	.....	....	....	....
Leather tanning and finishing	.666	.667	25.93	25.50	38.9	38.2	.481	.476	17.34	17.49	36.0	36.8
Lumber and millwork	.666	.679	25.66	27.87	38.5	41.0	....	....	.....	....	....	....
Meat packing	.726	.721	29.16	30.20	40.2	41.9	.544	.541	21.02	21.26	38.7	39.3
Paint and varnish	.730	.734	30.22	30.24	41.4	41.2	.531	.517	19.70	19.80	37.1	38.3
Paper and pulp	.657	.657	26.25	26.04	39.9	39.6	.428	.428	15.65	15.69	36.6	36.6
Paper products	.675	.678	27.10	27.52	40.1	40.6	.449	.453	17.01	16.93	37.9	37.4
Printing—book and job	.904	.928	36.49	37.07	40.4	39.9	.517	.521	19.23	18.16	37.2	34.8
Printing—news and magazine	1.010	1.018	37.12	37.17	36.8	36.5	.579	.589	19.87	19.95	34.3	33.9
Rubber	.963	.955	35.19	33.88	36.5	35.5	.580	.571	19.44	18.73	33.5	32.8
1. Rubber tires and tubes	1.052	1.044	38.50	36.97	36.6	35.4	.719	.722	24.86	23.62	34.6	32.7
2. Other rubber products	.794	.790	28.95	28.09	36.5	35.6	.524	.515	17.34	16.90	33.1	32.8
Silk	.577	.579	20.82	19.33	36.1	33.4	.389	.398	14.06	13.42	36.2	33.8
Wool	.640	.637	23.93	23.50	37.4	36.9	.516	.495	17.39	16.63	33.7	33.6
Foundries and machine shops	.754	.754	29.19	29.08	38.7	38.6	.477	.478	17.61	17.37	36.9	36.3
1. Foundries	.749	.751	26.52	26.13	35.4	34.8	.589	.559	19.79	19.46	33.6	34.8
2. Machines and machine tools	.752	.756	31.37	31.42	41.7	41.6	.519	.523	20.09	20.94	38.7	40.0
3. Heavy equipment	.777	.778	29.78	29.95	38.3	38.5	....	....	.....	....	....	....
4. Hardware and small parts	.697	.692	26.96	26.83	38.7	38.8	.458	.452	17.01	16.69	37.2	36.9
5. Other products	.773	.769	29.71	29.29	38.4	38.1	.479	.485	17.61	17.26	36.8	35.6
25 INDUSTRIES	$.766	$.767	$29.24	$28.54[r]	38.2	37.5[r]	$.473	$.471	$17.11	$16.74[r]	36.3	35.6
Cement	$.691	$.694	$26.97	$27.15	39.0	39.1	....	....	.....	....	....	....
Petroleum refining	.979	.985	34.97	35.78	35.7	36.3	....	....	.....	....	....	....
27 INDUSTRIES	$.768	$.770	$29.31	$28.64[r]	38.2	37.5[r]	....	....	.....	....	....	....

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[1] Based on data collected by the Automobile Manufacturers Association and THE CONFERENCE BOARD.

[2] Includes wood, metal, and upholstered household and office furniture.

[3] Based on data collected by the American Iron and Steel Institute and THE CONFERENCE BOARD.

[r] Revised.

EARNINGS AND HOURS, UNSKILLED AND SKILLED AND SEMISKILLED MALE WAGE EARNERS

August, 1939

Industry	Unskilled						Skilled and Semiskilled					
	Average Earnings				Average Hours per Week per Wage Earner		Average Earnings				Average Hours per Week per Wage Earner	
	Hourly		Weekly				Hourly		Weekly			
	Aug.	July	Aug.	July	Aug.	July	Aug.	July	Aug.	July	Aug.	July
Agricultural implement	$.649	$.645	$24.14	$24.71	37.2	38.3	$.829	$.827	$30.69	$31.80	37.0	38.4
Automobile[1]	.816	.797[r]	31.33	28.77[r]	38.4	36.1[r]	.992	.977[r]	37.00	32.34[r]	37.3	33.1[r]
Boot and shoe	.420	.432	16.59	15.98	39.5	37.0	.583	.581	21.98	21.73	37.7	37.4
Chemical	.693	.696	26.72	26.58	38.6	38.2	.826	.833	32.32	32.41	39.1	38.9
Cotton—North	.489	.489	19.28	19.37	39.5	39.6	.544	.547	20.59	21.05	37.9	38.5
Electrical manufacturing	.663	.669	25.53	26.09	38.5	39.0	.871	.876	33.53	33.81	38.5	38.6
Furniture[2]	.539	.519	21.88	19.31	40.6	37.2	.707	.716	27.43	27.28	38.8	38.1
Hosiery and knit goods	.463	.463	18.95	19.16	40.9	41.4	.715	.714	28.16	27.62	39.4	38.7
Iron and steel[3]	.629	.660	22.96	20.99	36.5	31.8	.901	.894	32.53	27.54	36.1	30.8
Leather tanning and finishing	.552	.553	21.13	20.32	38.3	36.7	.692	.695	26.79	26.83	38.7	38.6
Lumber and millwork	.480	.482	19.25	20.13	40.1	41.8	.741	.750	28.65	30.78	38.7	41.0
Meat packing	.630	.630	25.66	26.56	40.7	42.2	.777	.771	31.00	32.14	39.9	41.7
Paint and varnish	.620	.631	25.48	25.37	41.1	40.2	.789	.789	32.82	32.98	41.6	41.8
Paper and pulp	.540	.542	20.22	20.72	37.4	38.2	.698	.696	28.53	27.81	40.9	39.9
Paper products	.528	.537	21.50	21.94	40.7	40.9	.738	.737	29.43	29.85	39.9	40.5
Printing—book and job	.549	.549	22.84	22.31	41.6	40.6	1.022	1.036	40.86	41.16	40.0	39.7
Printing—news and magazine	.630	.632	22.50	22.30	35.7	35.3	1.097	1.105	40.61	40.66	37.0	36.8
Rubber	.674	.676	24.79	25.18	36.8	37.3	.972	.964	35.51	34.13	36.5	35.4
1. Rubber tires and tubes	.769	.769	27.20	27.25	35.4	35.4	1.059	1.051	38.80	37.22	36.6	35.4
2. Other rubber products	.567	.569	21.87	22.51	38.5	39.6	.804	.799	29.24	28.31	36.4	35.4
Wool	.521	.521	19.63	19.28	37.6	37.0	.701	.694	26.10	25.56	37.3	36.8
Foundries and machine shops	.616	.616	23.34	22.96	37.9	37.3	.780	.779	30.25	30.22	38.8	38.8
1. Foundries	.612	.607	22.35	21.56	36.5	35.5	.804	.808	28.11	27.88	35.0	34.5
2. Machines and machine tools	.576	.574	23.36	22.93	40.6	40.0	.769	.772	32.33	32.37	42.1	41.9
3. Heavy equipment	.616	.613	22.89	23.08	37.2	37.6	.803	.804	30.95	31.07	38.5	38.6
4. Hardware and small parts	.577	.570	21.97	21.59	38.1	37.9	.714	.708	27.55	27.66	38.6	39.1
5. Other products	.664	.672	25.26	24.73	38.1	36.8	.792	.787	30.49	30.15	38.5	38.3
24 INDUSTRIES[4]	$.591	$.593	$22.82	$22.41[r]	38.7	38.1[r]	$.811	$.810	$30.91	$30.10[r]	38.2	37.4[r]
Cement	$.588	$.594	$22.65	$22.84	38.5	38.5	$.712	$.714	$27.89	$28.03	39.2	39.3
Petroleum refining	.689	.687	25.01	24.53	36.3	35.7	1.030	1.038	36.67	37.78	35.6	36.4
26 INDUSTRIES[4]	$.592	$.594	$22.84	$22.44[r]	38.7	38.0[r]	$.814	$.813	$30.99	$30.22[r]	38.2	37.4[r]

[1] Based on data collected by the Automobile Manufacturers Association and THE CONFERENCE BOARD.
[2] Includes wood, metal, and upholstered household and office furniture.
[3] Based on data collected by the American Iron and Steel Institute and THE CONFERENCE BOARD.
[4] Silk industry not included, as adequate data for unskilled and skilled groups are not available for this industry.
[r] Revised.

Wages and the Cost of Living *(Continued from page 147)*

mobile industry, and 6.3% in the silk industry. In the lumber industry, on the other hand, average weekly earnings declined 7.9%. In the 25 industries combined, average weekly earnings were 8.6% higher than last year, and only 4.3% lower than in 1929 when they were $28.55. Real weekly earnings, that is, actual weekly earnings adjusted for changes in the cost of living, were 3.1% higher in August than in July, 10.4% higher than in August, 1938, and 13.3% higher than in 1929.

COST OF LIVING

The cost of living of wage earners dropped 0.5% from July to August, because of a decline of nearly 2% in food prices. The cost of living was 1.6% lower than a year ago, 15.6% lower than in 1929, but 17.9% higher than at the low point of 1933. The purchasing value of the dollar was 118.3 cents in August compared with 117.8 cents in July, 116.4 cents in August, 1938, and 100 cents in 1923.

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